A Method for Assessing the Retention of Trace Elements in Human Body Using Neural Network Technology

Tunakova Y., Novikova S., Ragimov A., Faizullin R., Valiev V.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2017 Yulia Tunakova et al. Models that describe the trace element status formation in the human organism are essential for a correction of micromineral (trace elements) deficiency. A direct trace element retention assessment in the body is difficult due to the many internal mechanisms. The trace element retention is determined by the amount and the ratio of incoming and excreted substance. So, the concentration of trace elements in drinking water characterizes the intake, whereas the element concentration in urine characterizes the excretion. This system can be interpreted as three interrelated elements that are in equilibrium. Since many relationships in the system are not known, the use of standard mathematical models is difficult. The artificial neural network use is suitable for constructing a model in the best way because it can take into account all dependencies in the system implicitly and process inaccurate and incomplete data. We created several neural network models to describe the retentions of trace elements in the human body. On the model basis, we can calculate the microelement levels in the body, knowing the trace element levels in drinking water and urine. These results can be used in health care to provide the population with safe drinking water.

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